Name: Date:

Polynomial Factoring solution (version 610)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 8x + 40 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(8) \pm \sqrt{(8)^2 - 4(1)(40)}}{2(1)}$$

$$x = \frac{-(8) \pm \sqrt{64 - 160}}{2(1)}$$

$$x = \frac{-8 \pm \sqrt{-96}}{2}$$

$$x = \frac{-8 \pm \sqrt{-16 \cdot 6}}{2}$$

$$x = \frac{-8 \pm 4\sqrt{6}\, i}{2}$$

$$x = -4 \pm 2\sqrt{6}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $8 + 2i$ and $-7 + 9i$ in standard form $(a + bi)$.**

Solution

$$(8 + 2i) \cdot (-7 + 9i)$$

$$-56 + 72i - 14i + 18i^2$$

$$-56 + 72i - 14i - 18$$

$$-56 - 18 + 72i - 14i$$

$$-74 + 58i$$

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3. **Write function $f(x) = x^3 - 2x^2 - 13x - 10$ in factored form. I'll give you a hint: one factor is $(x + 2)$.**

Solution

	1	-2	-13	-10
-2		-2	8	10
	1	-4	-5	0

$$f(x) = (x + 2)(x^2 - 4x - 5)$$

$$f(x) = (x + 2)(x + 1)(x - 5)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x + 2) \cdot (x - 3)^2 \cdot (x - 7)^2$$

Sketch a graph of polynomial $y = p(x)$.